

**IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
WACO DIVISION**

STC.UNM,

Plaintiff,

v.

APPLE INC.,

Defendant.

CIVIL ACTION NO. 6:19-cv-428

JURY TRIAL DEMANDED

**PLAINTIFF'S ORIGINAL COMPLAINT FOR
PATENT INFRINGEMENT AND JURY DEMAND**

Plaintiff STC.UNM files this Original Complaint for Patent Infringement and Jury Demand against Defendant Apple Inc. ("Defendant" or "Apple") Plaintiff alleges infringement of United States Patent Numbers 8,249,204 ("204 Patent"), 8,565,326 ("326 Patent"), and 8,265,096 ("096 Patent") as follows:

I. PARTIES

1. Plaintiff STC.UNM is a New Mexico nonprofit research park corporation formed, owned, and controlled entirely by the Board of Regents of the University of New Mexico ("UNM").

2. UNM is a public educational institution based in Albuquerque, New Mexico, and serves as the State of New Mexico's flagship research institution. UNM serves over 25,000 students and comprises over 1,700 faculty members across its main campus in Albuquerque and branch campuses in Gallup, Los Alamos, Rio Rancho, Taos, and Los Lunas, New Mexico.

3. Over the past 20 years, UNM researchers have disclosed over 1,700 new inventions, resulting in the issue of over 500 United States patents.

4. STC.UNM's mission includes nurturing inventions researched and developed at UNM, promoting technological collaboration between UNM and other universities and research institutes, and thereby catalyzing economic development in the State of New Mexico.

5. STC.UNM furthers its mission by licensing and, if necessary, enforcing its inventions and reinvesting proceeds into continued research and development at and technological collaboration with UNM, for the benefit of and for the State of New Mexico and the United States.

6. STC.UNM is located at the UNM Lobo Rainforest Building, 101 Broadway Boulevard, Suite 1100, Albuquerque, New Mexico 87102.

7. Plaintiff STC.UNM, UNM, and the Board of Regents of UNM are arms of the State of New Mexico and enjoy sovereign immunity under common law, statutes, and constitutions of the United States and the State of New Mexico including, but not limited to, the Eleventh Amendment of the United States Constitution and Article 12 of the New Mexico Constitution. *See Regents of University of New Mexico v. Knight*, 321 F.3d 1111 (Fed. Cir. 2003); *STC.UNM v. Quest Diagnostics Inc.*, CIV 17-1123 MV/KBM, 2019 WL 1091390, at *1 (D.N.M. Mar. 8, 2019).

8. By filing this lawsuit or prosecuting this action, Plaintiff STC.UNM does not waive, either expressly or implicitly, its sovereign immunity, the sovereign immunity of UNM or its Board of Regents, or the sovereign immunity enjoyed by any arm of the State of New Mexico under the laws of the United States or the State of New Mexico, to any *inter partes* review, *ex parte* reexamination, or other post-grant proceeding at the United States Patent and Trademark Office or its Patent Trial and Appeal Board, to any other administrative actions or proceedings whatsoever, to any noncompulsory counterclaims, or to any other federal or state proceedings whatsoever, whether initiated by Defendant or an entity other than Defendant.

9. Defendant is a California corporation, and has a physical place of business at 5505 W. Parmer Lane, Austin, Texas 78727. Defendant is actively transacting business in Texas. Defendant's Registered Agent for service of process is CT Corporation System, located at 1999 Bryan Street, Suite 900, Dallas, Texas 75201.

II. JURISDICTION

10. This action arises under the Patent Laws of the United States, 35 U.S.C. § 1, *et seq.*, including 35 U.S.C. §§ 271, 281, 283, 284, and 285. This is a patent infringement lawsuit over which this Court has subject matter jurisdiction under 28 U.S.C. §§ 1331 and 1338(a).

11. This United States District Court for the Western District of Texas has general and specific personal jurisdiction over Defendant because Defendant is present in and transacts and conducts business in and with residents of this District and the State of Texas.

12. Defendant maintains regular and established places of business in the State of Texas and in the Western District of Texas.

13. STC.UNM's causes of action arise, at least in part, from Defendant's contacts with and activities in this District and the State of Texas.

14. Defendant has committed acts of infringing the '204 Patent, the '096 Patent, and the '326 Patent within this District and the State of Texas by making, using, selling, offering for sale, and/or importing in or into this District and elsewhere in the State of Texas products made by practicing the claimed methods of the '204 Patent, the '096 Patent, and the '326 Patent. Defendant, directly and through intermediaries, makes, uses, sells, offers for sale, ships, distributes, advertises, promotes, and/or otherwise commercializes such infringing products in this District and the State of Texas. Defendant regularly conducts and solicits business in, engages in other persistent courses of conduct in, and/or derives substantial revenue from goods and services provided to residents of this District and the State of Texas.

III. VENUE

15. Venue is proper in this District because: (1) Defendant has a physical place located in the District, (2) it is a regular and established place of business, and (3) it belongs to Defendant. *See In re Cray Inc.*, 871 F.3d 1355, 1360 (Fed. Cir. 2017).

16. Defendant has been registered to do business in the State of Texas since May 16, 1980 under tax identification no. 19424041101.

17. Defendant's registered agent and office is CT Corporation System, 1999 Bryan Street, Suite 900, Dallas, Texas 75201.

18. Defendant maintains its second largest corporate office in this District. Specifically, Defendant's Texas corporate office is located at 5505 W. Parmer Lane, Austin, Texas 78727. This is a regular and established place of business belonging to Defendant.

19. In addition to the foregoing, Defendant has numerous other regular and established physical places of business in this District. Defendant has at least the following physical places of business located within the Western District of Texas:

Apple Store
2901 S. Capital of Texas Highway
Barton Creek Mall
Austin, TX 78746

Apple Store
11410 Century Oaks Terrace
Austin, TX 78758

Apple Store
450 W 2nd Street
Austin, TX 78701

Apple Store
12545 Riata Vista Circle
Austin, TX 78727

Apple Store
8401 Gateway Blvd West
El Paso, TX 79925

Apple Store
7400 San Pedro Avenue
San Antonio, TX 78216

Apple Store
15900 La Cantera Parkway
San Antonio, TX 78256

20. Defendant regularly conducts daily retail business to the public at the above-named locations. Such business includes selling, offering for sale, and using the Accused Instrumentalities identified in this Original Complaint.

21. The above-named places of business belong to Defendant.

22. STC.UNM does not waive its sovereign immunity as to any venue, including district courts and administrative tribunals, other than this Court, namely the United States District Court for the Western District of Texas, Waco Division.

IV. UNITED STATES PATENT NUMBER 8,249,204

23. United States Patent Number 8,249,204 is titled “Apparatus and method for channel state information feedback.” The ’204 Patent issued from United States Patent Application Number 12/339,000, which was filed on December 18, 2008 and claims priority to United States Provisional Patent Application Number 61/079,980, which was filed on July 11, 2008. The ’204 Patent was issued on August 21, 2012. A true and correct copy of the ’204 Patent is attached as Exhibit A.

24. The ’204 Patent claims patent-eligible subject matter and is valid and enforceable.

25. The ’204 Patent’s named inventors are Wen-Rong Wu, Tzu-Han Hsu, Jen-Yuan Hsu, and Pang-An Ting.

26. The ’204 Patent’s original patentee was the Industrial Technology Research Institute (“ITRI”), which acquired exclusive ownership of the patented invention by written assignments from Wen-Rong Wu, Tzu-Han Hsu, Jen-Yuan Hsu, and Pang-An Ting, recorded in the U.S. Patent & Trademark Office on or about February 26, 2009.

27. Thereafter, ITRI conveyed to Sino Matrix Technology, Inc. (“SMT”) all rights, title, and interest in and to the ’204 Patent, including the right to sue and recover for past infringements, by written assignment recorded in the U.S. Patent & Trademark Office (“USPTO”) on or about March 14, 2018.

28. Thereafter, SMT conveyed to STC.UNM all rights, title, and interest in and to the '204 Patent, including the right to sue and recover for past infringements, by written assignment recorded in the USPTO on or about September 11, 2018.

29. Defendant is not licensed to the '204 Patent, either expressly or implicitly, nor does it enjoy or benefit from any rights in or to the '204 Patent whatsoever.

V. UNITED STATES PATENT NUMBER 8,265,096

30. United States Patent Number 8,265,096 is titled "Method for Constructing Frame Structures." The '096 Patent issued from United States Patent Application Number 12/168,855, which was filed on July 7, 2008 and claims priority to United States Provisional Patent Application Number 60/929,798, which was filed on July 12, 2007, and United States Provisional Patent Application Number 60/973,157, which was filed on September 17, 2007. The '096 Patent issued on September 11, 2012. A true and correct copy of the '096 Patent is attached as Exhibit B.

31. The '096 Patent claims patent-eligible subject matter and is valid and enforceable.

32. The '096 Patent's named inventors are Yan-Xiu Zheng, Ren-Jr Chen, Chang-Lung Hsiao, and Pang-An Ting.

33. The '096 Patent's original patentee was ITRI, which acquired exclusive ownership of the patented invention by written assignments from Yan-Xiu Zheng, Ren-Jr Chen, Chang-Lung Hsiao, and Pang-An Ting, recorded in the U.S. Patent & Trademark Office on or about April 16, 2009.

34. Thereafter, ITRI conveyed to SMT all rights, title, and interest in and to the '096 Patent, including the right to sue and recover for past infringements, by written assignment recorded in the USPTO on or about March 14, 2018.

35. Thereafter, SMT conveyed to STC.UNM all rights, title, and interest in and to the '096 Patent, including the right to sue and recover for past infringements, by written assignment recorded

in the USPTO on or about September 11, 2018.

36. Defendant is not licensed to the '096 Patent, either expressly or implicitly, nor does it enjoy or benefit from any rights in or to the '096 Patent whatsoever.

VI. UNITED STATES PATENT NUMBER 8,565,326

37. United States Patent Number 8,565,326 is titled "System and Method for Bit Allocation and Interleaving." The '326 Patent issued from United States Patent Application Number 12/425,004, which was filed on April 16, 2009 and claims priority to United States Provisional Patent Application Number 61/079,104, which was filed on July 8, 2008. The '326 Patent issued on October 22, 2013. A true and correct copy of the '326 Patent is attached as Exhibit C.

38. The '326 Patent claims patent-eligible subject matter and is valid and enforceable.

39. The '326 Patent's named inventors are Chien-Yu Kao, Jen-Yuan Hsu, Pang-An Ting, and Chia-Lung Tsai.

40. The '326 Patent's original patentee was ITRI, which acquired exclusive ownership of the patented invention by written assignments from Chien-Yu Kao, Jen-Yuan Hsu, Pang-An Ting, and Chia-Lung Tsai, recorded in the U.S. Patent & Trademark Office on or about April 16, 2009.

41. Thereafter, ITRI conveyed to SMT all rights, title, and interest in and to the '326 Patent, including the right to sue and recover for past infringements, by written assignment recorded in the USPTO on or about March 14, 2018.

42. Thereafter, SMT conveyed to STC.UNM all rights, title, and interest in and to the '326 Patent, including the right to sue and recover for past infringements, by written assignment recorded in the USPTO on or about September 12, 2018.

43. Defendant is not licensed to the '326 Patent, either expressly or implicitly, nor does it enjoy or benefit from any rights in or to the '326 Patent whatsoever.

VII. THE ACCUSED INSTRUMENTALITIES

44. Defendant designs, manufactures, imports, uses, sells, offers for sale, and markets consumer electronics, communications equipment, networking devices, and wireless receivers, including the following “Accused Instrumentalities”:

(1) **iPhone 6** model numbers A1549, A1586, and A1589 with FCC ID BCG-E2816A; internal name N61AP, identifier iPhone 7,2; and product numbers MG3D2, MG492, MG4Q2, MG562, MG5Y2, MG6C2, MQ3E2, MG3L2, MG4J2, MG502, MG652, MG6J2, MG842, MG3G2, MG4E2, MG4V2, MG622, MG3C2, MG4P2, MG482, MG5X2, MG552, MG6A2, MG7W2, MG3K2, MG4H2, MG4X2, MG5C2, MG6H2, MG642, MG822, MG3F2, MG4C2, MG3A2, MG4N2, MG472, MG5W2, MG542, MG692, MQ3D2, MQ462, MG3H2, MG4F2, MG4W2, MG5A2, MG6G2, MG632, MG3E2, MG4A2, MG4R2, and/or MG602 (collectively referred to as “iPhone 6”);

(2) **iPhone 6 Plus** model numbers A1522, A1524, and A1593 with FCC ID BCG-E2817A; internal name N56AP; identifier iPhone 7,1; and product numbers MGAA2, MGAN2, MGC12, MGCM2, MGCX2, MGAK2, MGAW2, MGC72, MGAF2, MGAR2, MGC42, MGCQ2, MGA92, MGC92, MGAM2, MGC02, MGCL2, MGAJ2, MGAV2, MGC62, MGAE2, MGAQ2, MGC32, MGA82, MGAL2, MGAX2, MGCK2, MGAH2, MGAU2, MGC52, MGCR2, MGAC2, MGAP2, MGC22, and/or MGCN2 (collectively referred to as “iPhone 6 Plus”);

(3) **iPhone 6s** model numbers A1633, A1688, A1691, and A1700 with FCC ID BCG-E2946A; internal names N71AP and/or N71mAP; identifier iPhone 8,1; and product numbers MKQL2, MKQ72, MKR12, MKRE2, MKRW2, MKT92, ML7E2, MN0P2, MN172, MN1K2, MN1U2, MN1Y2, MKQC2, MKQQ2, MKR52, MKRJ2, MKT12, MKTE2, ML7J2, MKQG2, MKQV2, MKR92, MKRP2, MKT52, MKTJ2, ML7N2, MKQM2, MKQ82, MKRF2, MKRX2, MKR22, MKTA2, ML7F2, MN0V2, MN192, MN1L2, MN1V2, MN202, MKQD2, MKQR2, MKR62, MKRK2, MKT22, MKTF2, ML7K2, MKQH2, MKQW2, MKRA2, MKRQ2, MKT62, MKTK2, ML7P2, MKQ62, MKQK2, MKQY2, MKRD2, MKRT2, MKT82, ML7D2, NKQJ2, MN0N2, MN162, MN1G2, MN1Q2, MN1X2, MKQA2, MKQP2, MKR42, MKRH2, MKT02, MKTD2, ML7H2, MKQF2, MKQU2, MKR82, MKRM2, MKT42, MKTH2, ML7M2, MKQ52, MKQJ2, MKQX2, MKRC2, MKRR2, MKT72, ML7C2, MN0M2, MN132, MN1E2, MN1M2, MN1W2, MKQN2, MKQ92, MKR32, MKRG2, MKRY2, MKTC2, ML7G2, MKQE2, MKQT2, MKR72, MKRL2, MKT32, MKTG2, and/or ML7L2 (collectively referred to as “iPhone 6s”);

(4) **iPhone 6s Plus** model numbers A1634, A1687, A1690, and A1699 with FCC ID BCG-E2944A; internal names N66AP and/or N66mAP; identifier iPhone 8,2; and product numbers MKTN2, MKU32, MKUN2, MKV62, MKVQ2, MKW72, ML6D2, MKTT2, MKU82, MKUV2, MKVD2, MKVX2, MKWD2, ML6H2, MKTX2, MKUF2, MKV12, MKVH2, MKW22, MKWH2, ML6M2, MKU52, ML6E2, MKTP2, MKUP2, MKV72, MKVU2, MKW82, MKU92, ML6J2, MKTU2, MKUW2, MKVE2, MKVY2, MKWE2, MKUG2, MKV22, ML6N2, MKVJ2, MKTY2, MKTM2, MKU22, MKUJ2, MKV52, MKVP2, MKW62, ML6C2, MKTR2, MKU72, MKUU2, MKV92, MKVW2, MKWC2, ML6G2, MKTW2,

MKUE2, MKUY2, MKVG2, MKW12, MKWG2, ML6L2, MKU12, ML6A2, MKV32, MKTL2, MKUH2, MKVN2, MKW52, MKU62, ML6F2, MKTQ2, MKUQ2, MKV82, MKVV2, MKW92, ML642, MKUD2, ML6K2, MKTV2, MKUX2, MKVF2, MKW02, and/or MKWF2 (collectively referred to as “iPhone 6s Plus”);

(5) **iPhone SE** model numbers A1662, A1723, and A1724 with FCC ID BCG-E2945A and/or BCG-E3042A; internal names N69AP and/or N69uAP; identifier iPhone 8,4; and product numbers MLXH2, MLXW2, MLY12, MLY52, MLY92, MLXM2, MP8D2, MP8R2, MP8H2, MP8M2, MP7V2, MP842, MLXK2, MLXY2, MLY32, MLY72, MLYC2, MLXP2, MP952, MP9J2, MP992, MP9E2, MP802, MP882, MLXJ2, MLXX2, MLY22, MLY62, MLYA2, MLXN2, MP8E2, MP8T2, MP8J2, MP8N2, MP7W2, MP852, MLXL2, MLY02, MLY42, MLY82, MLYD2, MLXQ2, MP962, MP9K2, MP9A2, MP9F2, MP812, MP892, MLLM2, MLLV2, MLLX2, MLM02, MLM32, MLLP2, MP8C2, MP8Q2, MP8G2, MP8L2, MP7U2, MP832, MLM52, MLMC2, MLME2, MLMG2, MLMJ2, MLM72, MP942, MP9H2, MP982, MP9D2, MP7Y2, MP872, MLLL2, MLLU2, MLLW2, MLLY2, MLM22, MLLN2, MP8A2, MP8P2, MP8F2, MP8K2, MP7T2, MP822, MLM42, MLM62, MLMA2, MLMD2, MLMF2, MLMH2, MP932, MP9G2, MP972, MP9C2, MP7X2, and/or MP862 (collectively referred to as “iPhone SE”);

(6) **iPhone 7** model numbers A1660, A1779, A1780, and A1778 with FCC ID BCG-E3085A, BCG-E3086A, and/or BCG-E3091A; internal names D10AP and/or D101AP; identifier iPhone 9,1 and/or iPhone 9,3; and product numbers MN8G2, MNAC2, MNAY2, MNCE2, MNGQ2, MN8L2, MNAJ2, MNC32, MNCK2, MNGX2, MN8R2, MNAQ2, MNC82, MNCQ2, MN8J2, MNAE2, MNC12, MNCG2, MN8N2, MNAL2, MNC52, MNCM2, MNH02, MN8U2, MNAV2, MNCA2, MNCT2, MN8Q2, MNAP2, MNC72, MNCP2, MN8W2, MNAX2, MNCD2, MNCV2, MPRV2, MPRT2, MPRH2, MPRL2, MPRW2, MPRU2, MPRJ2, MPRM2, MN8K2, MNAF2, MNC22, MNCJ2, MN8P2, MNAM2, MNC62, MNH12, MNCN2, MN8V2, MNAW2, MNCC2, MNCU2, MN8H2, MNAD2, MNC02, MNCF2, MN8M2, MNAK2, MNC42, MNCL2, MN8T2, MNAU2, MNC92, MNCR2, MN9D2, MN9U2, MN8X2, MN9H2, MN9Y2, MN922, MN9N2, MNA62, MN972, MN9F2, MN9W2, MN902, MN9K2, MNA32, MN942, MN9Q2, MNA82, MN9M2, MNA52, MN962, MN9T2, MNAA2, MN9C2, MPRN2, MPRQ2, MPRP2, MPRR2, MN9G2, MN9X2, MN912, MN9L2, MNA42, MN952, MN9R2, MNA92, MN9E2, MN9V2, MN9J2, MNA02, MN9P2, and/or MNA72 (collectively referred to as “iPhone 7”);

(7) **iPhone 7 Plus** model numbers A1661, A1785, A1786, and A1784 with FCC ID BCG-E3087A, BCG-E3088A, and/or BCG-E3092A; internal names D11AP and/or D111AP; identifier iPhone 9,2 and/or iPhone 9,4; and product numbers MNQH2, MNR12, MNR52, MNR92, MNRJ2, MN482, MN5T2, MN642, MN6F2, MNFP2, MN4E2, MN5Y2, MN692, MN6L2, MNFV2, MNQK2, MNR32, MNR72, MNRC2, MNRL2, MN4A2, MN5V2, MN662, MN6H2, MNFR2, MN4J2, MN612, MN6C2, MN6N2, MN4D2, MN5X2, MN682, MN6K2, MN4L2, MN632, MN6E2, MN6Q2, MPR12, MPR02, MPQV2, MPQW2, MPRA2, MPR92, MPR52, MPR62, MNQL2, MNR42, MNR82, MNRD2, MNRM2, MN4C2, MN5W2, MN672, MN6J2, MNFT2, MN4K2, MN622, MN6D2, MN6P2, MNFY2, MNQJ2, MNR22, MNR62, MNRA2, MNRK2, MN492, MN5U2, MN652, MN6G2, MNFQ2, MN4F2, MN602, MN6A2, MN6M2, MNQR2, MNQW2, MNQM2, MN522, MN5G2, MN4M2, MN592, MN5M2,

MN4W2, MNQU2, MNQY2, MNQP2, MN552, MN5J2, MN4Q2, MN5D2, MN5P2, MN4Y2, MN572, MN5L2, MN4V2, MN5F2, MN5R2, MPQW2, MPQY2, MPR72, MPR82, MNQV2, MNR02, MNQQ2, MN562, MN5K2, MN4U2, MN5E2, MN5Q2, MNQT2, MNQX2, MNQN2, MN532, MN5H2, MN4P2, MN5C2, MN5N2, MN4X2, and/or MN502 (collectively referred to as “iPhone 7 Plus”);

(8) **iPhone 8** model numbers A1863, A1906, A1907, and A1905 with FCC ID BCG-E3159A, BCG-E3171A, and/or BCG-E3172A; internal names D20AP, D20AAP, D201AP, and/or D201AAP; identifiers iPhone 10,1 and/or iPhone 10,4; and product numbers MQ6M2, MQ742, MQ772, MQ7H2, MQ802, MQ832, MQ6L2, MQ732, MQ762, MQ7G2, MQ7Y2, MQ822, MQ6K2, MQ722, MQ752, MQ7F2, MQ7X2, MQ812, MRRK2, MRRR2, MRRT2, MRRL2, MRRW2, MRRX2, MQ6J2, MQ6X2, MQ712, MQ7E2, MQ7T2, MQ7W2, MQ6H2, MQ6W2, MQ702, MQ7D2, MQ7R2, MQ7V2, MQ6G2, MQ6V2, MQ6Y2, MQ7C2, MQ7Q2, MQ7U2, MRRM2, MRRP2, MRRQ2, MRRN2, MRRU2, and/or MRRV2 (collectively referred to as “iPhone 8”);

(9) **iPhone 8 Plus** model numbers A1864, A1898, A1899, and A1897 with FCC ID BCG-E3160A, BCG-E3173A, and/or BCG-E3174A; internal names D21AP, D21AAP, D211AP, and/or D211AAP; identifiers iPhone 10,2 and/or iPhone 10,5; and product numbers MQ8F2, MQ9F2, MQ982, MQ8J2, MQ9C2, MQ9J2, MQ8E2, MQ9E2, MQ972, MQ8H2, MQ9A2, MQ9H2, MQ8D2, MQ9D2, MQ962, MQ8G2, MQ9G2, MQ992, MRTG2, MRTJ2, MRT72, MRTH2, MRTK2, MRT82, MQ8N2, MQ8V2, MQ922, MQ8R2, MQ8Y2, MQ952, MQ8M2, MQ8U2, MQ912, MQ8Q2, MQ8X2, MQ942, MQ8L2, MQ8T2, MQ902, MQ8P2, MQ8W2, MQ932, MRTC2, MRTE2, MRT92, MRTA2, MRTD2, and/or MRTF2 (collectively referred to as “iPhone 8 Plus”);

(10) **iPhone X** model numbers A1865, A1902, and A1901 with FCC ID BCG-E3161A and/or BCG-E3175A; internal names D22AP and/or D221AP; identifiers iPhone 10,3 and/or iPhone 10,6; and product numbers MQCT2, MQCL2, MQAY2, MQA62, MQCW2, MQCP2, MQC22, MQA92, MQCR2, MQCK2, MQAX2, MQA52, MQCV2, MQCN2, MQC12, MQA82, MQAK2, MQAR2, MQAD2, MQAN2, MQAV2, MQAG2, MQAJ2, MQAQ2, MQAC2, MQAM2, MQAU2, and/or MQAF2 (collectively referred to as “iPhone X”);

(11) **iPhone XS** with internal names D32AP and/or D321AP; and identifier iPhone 11,2 (collectively referred to as “iPhone XS”);

(12) **iPhone XR** with internal names D84P and/or D841AP; and identifier iPhone 11,8 (collectively referred to as “iPhone XR”);

(13) **iPhone XS Max** with internal names D33AP, D331AP, and/or D331pAP; and identifiers iPhone 11,4 and iPhone 11,6 (collectively referred to as “iPhone XS Max”);

(14) **iPad Pro** (1st generation) model numbers A1584, A1652, A1673, A1674, and A1675 with FCC ID BCGA1584, BCGA1652, BCGA1673, and/or BCGA1674; internal names J98aAP, J99aAP, J127AP and/or J128AP, identifiers iPad 6,7, iPad 6,8, iPad 6,3 or iPad 6,4; and product numbers ML0H2, ML0R2, ML0V2, ML0G2, ML0Q2, ML0U2, ML0F2, ML0N2,

ML0T2, ML3Q2, ML2K2, ML3P2, ML3Z2, ML2N2, ML412, ML3N2, ML2J2, ML3O2, ML3W2, ML2M2, ML3K2, ML2I2, ML3T2, ML2L2, MLMQ2, MLMX2, MLN12, MLMP2, MLMW2, MLN02, MLMN2, MLMV2, MLMY2, MM172, MM192, MM1A2, MLPY2, MLQ52, MLQ82, MLPX2, MLQ42, MLQ72, MLPW2, MLQ32, MLQ62, MLYJ2, MLYL2, and/or MLYM2 (collectively referred to as “iPad Pro 1”);

(15) **iPad Pro** (2nd generation) model numbers A1670, A1671, A1821, A1701, and A1709 with FCC ID BCGA1670, BCGA1671, BCGA1701 and/or BCGA1709; internal names J120AP, J207AP, J121AP, J207AP, and/or J208AP; identifiers iPad 7,1, iPad 7,2, iPad 7,3, or iPad 7,4; and product numbers MQDD2, MP6J2, MPL12, MQDC2, MP6H2, MPL02, MQDA2, MP6G2, MPKY2, MQEF2, MPA62, MPLL2, MQEE2, MPA52, MPLK2, MQED2, MPA42, MPLJ2, MQDX2, MPF12, MPGK2, MQDY2, MPF22, MPGL2, MQDW2, MPF02, MPGJ2, MQDT2, MPDY2, MPGH2, MQF12, MPHJ2, MPMG2, MQF22, MPHK2, MPMH2, MQF02, MPH22, MPMF2, MQEY2, MPHG2, and/or MPME2 (collectively referred to as “iPad Pro 2”

(16) **iPad** (5th generation) model numbers A1822 and A1823 with FCC ID BCGA1822 and/or BCGA1823; internal names J71sAP, J71tAP, J72sAP, and/or J72tAP; identifiers iPad 6,11 and/or iPad 6,12; and product number MPGT2, MPGW2, MP2G2, MP2J2, MP2F2, MP2H2, MPGA2, MPGC2, MP252, MP2E2, MP242, and/or MP2D2 (collectively referred to as “iPad 5”);

(17) **iPad** (6th generation) model numbers A1893 and A1954 with FCC ID BCGA1954 and/or BCGA1893; internal names J71bAP and/or J72bAP; identifiers iPad 7,5 and/or iPad 7,6; and product number MRJN2, MRJP2, MR7G2, MR7K2, MR7F2, MR7J2, MRM52, MRM82, MR702, MR7D2, MR6Y2, and/or MR7C2 (collectively referred to as “iPad 6”);

(18) **iPad Air 2** model numbers A1566 and A1567 with FCC ID BCGA1566 and/or BCGA1567; internal names J81AP and J82AP; identifiers iPad 5,3 and iPad 5,4; and product numbers MH0W2, MNV72, MH182, MH1J2, MGL2, MNV62, MGKM2, MGTY2, MGL12, MNV22, MGKL2, MGTX2, MH2W2, MH1C2, MNW32, MH2P2, MH172, MH332, MH2D2, MH1G2, MH2V2, MGHC2, MNW22, MH2N2, MGHY2, MGK02, MH322, MGWM2, MGGX2, MH2U2, MGH62, MNW12, MH2M2, MGHX2, MGJY2, MH312, and/or MGWL2 (collectively referred to as “iPad Air 2”);

(19) **iPad Mini 4** model number A1550 with FCC ID BCGA1550; internal name J97AP; identifier iPad 5,2, and product number MK882, MK712, MNWR2, MNWG2, MK8C2, MK752, MK8F2, MK782, MK872, MK702, MK7X2, MNWQ2, MNWF2, MK8A2, MK732, MK8E2, MK772, MK862, MK7L2, MNWP2, MK892, MK722, MK8D2, and/or MK762 (collectively referred to as “iPad Mini 4”);

(20) **Apple TV** (4th generation) model number A1625 with FCC ID BCGA1625; internal name J42dAP, identifier AppleTV 5,3; and product numbers MGY52, ML4W2, MR912, and/or MLNC2 (collectively referred to as “Apple TV 4”);

(21) **Apple TV 4K** model number A1842 with FCC ID BCGA1842; internal name J105aAP, identifier AppleTV 6,2; and product numbers MQD22 and/or MP7P2 (collectively

referred to as “Apple TV 4K”);

(22) **iPod touch** (6th generation) model number A1574 with FCC ID BCGA1574; internal name N102AP; identifier iPod 7,1; and product numbers MKH22, MKHV2, MKHE2, MKWP2, MKH02, MKHT2, MKHC2, MKWM2, MKGX2, MKHQ2, MKGW2, MKWK2, MKH82, MKJ22, MKHN2, MKWW2, MKH42, MKHX2, MKHJ2, MKWR2, MKH62, MKJ02, MKHL2, and/or MKWU2 (collectively referred to as “iPod touch 6”);

(23) **MacBook Air** model numbers A1465 and/or A1466 with FCC ID BCGA1465 and/or BCGA1466; internal names J11 and/or J13; identifiers MacBookAir 6,1, MacBookAir 6,2, MacBookAir 7,1, and/or MacBookAir 7,2; and product numbers MD711LL/A, . MD712LL/A, MD760LL/A, MD761LL/A, MD711LL/B, MD712LL/B, MD760LL/B, MD761LL/B, MJVM2LL/A, MJVP2LL/A, MJVE2LL/A, MJVG2LL/A, MMGF2LL/A, and/or MMGG2LL/A (collectively referred to as “MacBook Air”);

(24) **MacBook** model number A1534 with FCC ID BCGA1534; identifiers MacBook 8,1, MacBook 9,1, and/or MacBook 10,1; and product numbers MF855LL/A, MF865LL/A, MJY32LL/A, MJY42LL/A, MK4M2LL/A, MK4N2LL/A, MLH72LL/A, MLH82LL/A, MLHA2LL/A, MLHC2LL/A, MLHE2LL/A, MLHF2LL/A, MMGL2LL/A, MMGM2LL/A, MNYF2LL/A, MNYG2LL/A, MNYH2LL/A, MNYJ2LL/A, MNYK2LL/A, MNYL2LL/A, MNYM2LL/A, and/or MNYN2LL/A (collectively referred to as “MacBook”);

(25) **MacBook Pro** (3rd generation) model numbers A1398, A1425, and/or A1502 with identifiers MacBookPro 10,1, MacBookPro 10,2, MacBookPro 11,1, MacBookPro 11,2, MacBookPro 11,3, MacBookPro 11,4, MacBookPro 11,5, and/or MacBookPro 12,1; and product numbers MC975*/A, MC976*/A, MD831*/A, MD212*/A, MD213*/A, ME664*/A, ME665*/A, ME698*/A, ME662*/A, ME663*/A, ME697*/A, ME864*/A, ME865*/A, ME866*/A, ME293*/A, ME294*/A, MGX72*/A, MGX82*/A, MGX92*/A, MGXA2*/A, MGXC2*/A, MF839*/A, MF840*/A, MF841*/A, MJLQ2*/A, and/or MJLT2*/A (collectively referred to as “MacBook Pro 3”);

(26) **MacBook Pro** (4th generation) model numbers A1706, A1707, A1708, A1989, and/or A1990 with FCC ID BCGA1706, BCGA1707, BCGA1708, BCGA1989, and/or BCGA1990; identifiers MacBookPro 13,1, MacBookPro 13,2, MacBookPro 13,3, MacBookPro 14,1, MacBookPro 14,2, MacBookPro 14,3, MacBookPro 15,1, and/or MacBookPro 15,2; and product numbers MLL42LL/A, MLUQ2LL/A, MLH12LL/A, MLVP2LL/A, MNQF2LL/A, MNQG2LL/A, MLH32LL/A, MLH42LL/A, MLW72LL/A, MLW82LL/A, MPXQ2LL/A, MPXR2LL/A, MPXT2LL/A, MPXU2LL/A, MPXV2LL/A, MPXW2LL/A, MPXX2LL/A, MPXY2LL/A, MPTR2LL/A, MPTT2LL/A, MPTU2LL/A, MPTV2LL/A, MR9Q2LL/A, MR9R2LL/A, MR9T2LL/A, MR9U2LL/A, MR9V2LL/A, MR932LL/A, MR942LL/A, MR952LL/A, MR962LL/A, and/or MR972LL/A (collectively referred to as “MacBook Pro 4”);

(27) **iMac** (4th generation) model numbers A1418 and/or A1419 with identifiers iMac 14,1, iMac 14,2, iMac 14,3, iMac 14,4, iMac 16,1, and/or iMac 18,1; and product numbers ME086XX/A, ME087XX/A, ME088XX/A, ME089XX/A, MF883XX/A, MG022XX/A, MK142XX/A, MK442XX/A, and/or MMQA2LL/A (collectively referred to as “iMac 4”);

(28) **iMac** (5th generation) model numbers A1418 and/or A1419 with identifiers iMac 15,1, iMac 16,2, iMac 17,1, iMac 17,2, iMac 18,2, and/or iMac 18,3; and product numbers MF886XX/A, MF885XX/A, MK452XX/A, MK462XX/A, MK472XX/A, MK482XX/A, MNDY2xx/A, MNE02xx/A, MNE92xx/A, MNEA2xx/A, and/or MNED2xx/A (collectively referred to as “iMac 5”);

(29) **iMac Pro** model number A1862 with FCC ID BCGA1862; identifier iMacPro 1,1; and product number MQ2Y2LL/A (collectively referred to as “iMac Pro”);

(30) **MacPro** (2nd generation) model number A1481 with identifier MacPro 6,1 and product numbers ME253LL/A, MD878LL/A, and/or MQGG2LL/A (collectively referred to as “MacPro 2”); and

(31) **Mac Mini** (3rd generation) model number A1347 with identifier Macmini 7,1 and product numbers MGEM2*/A, MGEN2*/A, MGEQ2*/A (collectively referred to as “Mac Mini 3”).

45. Defendant’s Accused Instrumentalities are adapted to operate in and with wireless telecommunications networks that at least comply with the requirements of the IEEE 802.11ac wireless networking standard (referred to as “Wireless Telecommunications Networks”).

VIII. DIRECT, INDUCED, CONTRIBUTORY, AND WILLFUL INFRINGEMENT OF THE ’204 PATENT

46. Defendant’s Accused Instrumentalities capable of operation on a Wireless Telecommunications Network comprise mobile stations that communicate with base stations via communication channels. Channel state information or “CSI” can be provided from a mobile station to a base station. The mobile station is configured to estimate CSI by calculating responses for each communication channel and selecting channel taps from each calculated channel response. It can also compress the estimated CSI and send it as feedback to the base station. An exemplary chart illustrating this and how at least one claim of the ’204 Patent covers an Accused Instrumentality is attached as Exhibit D.

47. Defendant has and continues to directly infringe the ’204 Patent, literally and/or under the doctrine of equivalents, by making, using, selling, offering for sale, and/or importing in or into

the United States one or more apparatuses that embody and practice at least claims 1, 11, and/or 12 of the '204 Patent in violation of 35 U.S.C. § 271(a), including but not limited to Defendant's Accused Instrumentalities capable of operation on a Wireless Telecommunications Network.

48. Defendant likewise has, with knowledge of the '204 Patent, and without authority, actively induced and continues to actively induce infringement of at least claims 1, 11, and/or 12 of the '204 Patent under 35 U.S.C. § 271(b), by intentionally inducing the infringing use, offer for sale, and/or sale of the Accused Instrumentalities by and with Wireless Telecommunication Networks and their operators and end-users. Each Accused Instrumentality is intended for use as a mobile station that communicates with base stations via communication channels and employs the patented provision of CSI from a mobile station to a base station, configuration of the mobile station to estimate CSI by calculating responses for each communication channel and selecting channel taps from each calculated channel response, compression of the estimated CSI, and feedback to the base station. The Accused Instrumentalities are designed to be used by and with Wireless Telecommunications Networks and their operators in an infringing manner that practices the '204 Patent. Similarly, the Accused Instrumentalities are configured to be used by end-users of the Wireless Telecommunications Networks in an infringing manner that practices the '204 Patent.

49. Defendant actively induces Wireless Telecommunications Network operators and end-users to practice the '204 Patent, without authority, by, *inter alia*, designing and introducing into the stream of commerce the Accused Instrumentalities, which are pre-configured to employ the patented provision of CSI from a mobile station to a base station, configuration of the mobile station to estimate CSI by calculating responses for each communication channel and selecting channel taps from each calculated channel response, compression of the estimated CSI, and feedback to the base station. Defendant encourages infringing use of the Accused Instrumentalities by the Wireless Telecommunications Network operators and end-users by, for example, publishing

manuals and promotional literature describing and instructing in the operation of the Accused Instrumentalities in an infringing manner. At the encouragement by and direction of Defendant, the Wireless Telecommunications Network operators sell and offer for sale Accused Instrumentalities to end-users to be used in an infringing manner. Such conduct results in induced infringements of at least claims 1, 11, and/or 12 of the '204 Patent when the Accused Instrumentalities are used for their intended purpose. Defendant has had knowledge that the acts of Wireless Telecommunications Network operators and end-users constitute direct infringement of at least one claim of the '204 Patent since it received notice of its infringement of the '204 Patent.

50. Defendant likewise is liable for contributory infringement. Defendant, with knowledge of the '204 Patent, and without authority, has offered to sell, sold, and/or imported into the United States the Accused Instrumentalities for use in practicing the patented apparatus and methods embodied in at least claims 1, 11, and/or 12, which use constitutes a material part of the claimed invention. Defendant offered to sell, sold, and/or imported into the United States the Accused Instrumentalities knowing that each is especially made or adapted for use in infringing the '204 Patent, and that each is not a staple article or commodity of commerce suitable for substantial noninfringing use as packaged, advertised, and/or sold because the Accused Instrumentalities are pre-configured by Defendant to employ the patented provision of CSI from a mobile station to a base station, configuration of the mobile station to estimate CSI by calculating responses for each communication channel and selecting channel taps from each calculated channel response, compression of the estimated CSI, and feedback to the base station.

51. Defendant has had actual knowledge of the '204 Patent since no later than September 26, 2018.

52. Defendant has continued making, using, offering for sale, selling, and/or importing the accused instrumentalities despite an objectively high likelihood that its actions infringe at least

one claim of the '204 Patent, thus making Defendant liable for willful infringement damages pursuant to 35 U.S.C. § 284.

53. Defendant's direct, indirect, contributory, and willful infringement of the '204 Patent has caused, and will continue to cause, substantial and irreparable damage to STC.UNM. Therefore, STC.UNM is entitled to an award of damages adequate to compensate for Defendant's infringement of the '204 Patent, but not less than a reasonable royalty, together with pre- and post-judgment interest, attorneys' fees, and costs as fixed by the Court under 35 U.S.C. §§ 284 and 285.

IX. DIRECT, INDUCED, CONTRIBUTORY, AND WILLFUL INFRINGEMENT OF THE '096 PATENT

54. Defendant's Accused Instrumentalities capable of operation on a Wireless Telecommunications Network employ the patented frame structure for data transmission in which legacy communication format and very high throughput communication format are combined into a unitary frame structure. An exemplary chart illustrating this and how at least one claim of the '096 Patent covers an Accused Instrumentality is attached as Exhibit E.

55. Defendant has and continues to directly infringe the '096 Patent, literally and/or under the doctrine of equivalents, by making, using, selling, offering for sale, and/or importing in or into the United States one or more apparatuses that embody and practice at least claim 8 of the '096 Patent in violation of 35 U.S.C. § 271(a), including but not limited to Defendant's Accused Instrumentalities capable of operation on a Wireless Telecommunications Network.

56. Defendant likewise, with knowledge of the '096 Patent, and without authority, has actively induced and continues to actively induce infringement of at least claim 8 of the '096 Patent under 35 U.S.C. § 271(b), by intentionally inducing the infringing use, offer for sale, and/or sale of the Accused Instrumentalities by and with Wireless Telecommunication Networks and their operators and end-users. Each Accused Instrumentality employs the patented frame structure for data transmission in either the legacy format or the VHT format within a single frame. The Accused

Instrumentalities are designed to be used by and with Wireless Telecommunications Networks and their operators in an infringing manner that practices the '096 Patent. Similarly, the Accused Instrumentalities are configured to be used by end-users of the Wireless Telecommunications Networks in an infringing manner that practices the '096 Patent.

57. Defendant actively induces Wireless Telecommunications Network operators and end-users to practice the '096 Patent, without authority, by, *inter alia*, designing and introducing into the stream of commerce the Accused Instrumentalities, which employ the patented frame structure for data transmission. Defendant encourages infringing use of the Accused Instrumentalities by the Wireless Telecommunications Network operators and end-users by, for example, publishing manuals and promotional literature describing and instructing in the operation of the Accused Instrumentalities in an infringing manner. At the encouragement by and direction of Defendant, the Wireless Telecommunications Network operators sell and offer for sale Accused Instrumentalities to end-users to be used in an infringing manner. Such conduct results in induced infringements of at least claim 8 of the '096 Patent when the Accused Instrumentalities are used for their intended purpose. Defendant has had knowledge that the acts of Wireless Telecommunications Network operators and end-users constitute direct infringement of at least one claim of the '096 Patent since it received notice of its infringement of the '096 Patent.

58. Defendant likewise is liable for contributory infringement. Defendant, with knowledge of the '096 Patent, and without authority, has offered to sell, sold, and/or imported into the United States the Accused Instrumentalities for use in practicing the patented apparatus and methods embodied in at least claim 8, which use constitutes a material part of the claimed invention. Defendant offered to sell, sold, and/or imported into the United States the Accused Instrumentalities knowing that each is especially made or adapted for use in infringing the '096 Patent, and that each is not a staple article or commodity of commerce suitable for substantial

noninfringing use as packaged, advertised, and/or sold because the Accused Instrumentalities are pre-configured by Defendant to employ the patented frame structure for data transmission.

59. Defendant has had actual knowledge of the '096 Patent since no later than September 26, 2018.

60. Defendant has continued making, using, offering for sale, selling, and/or importing the accused instrumentalities despite an objectively high likelihood that its actions infringe at least one claim of the '096 Patent thus making Defendant liable for willful infringement damages pursuant to 35 U.S.C. § 284.

61. Defendant's direct, indirect, contributory, and willful infringement of the '096 Patent has caused, and will continue to cause, substantial and irreparable damage to STC.UNM. Therefore, STC.UNM is entitled to an award of damages adequate to compensate for Defendant's infringement of the '096 Patent, but not less than a reasonable royalty, together with pre- and post-judgment interest, attorneys' fees, and costs as fixed by the Court under 35 U.S.C. §§ 284 and 285.

X. DIRECT, INDUCED, CONTRIBUTORY, AND WILLFUL INFRINGEMENT OF THE '326 PATENT

62. Defendant's Accused Instrumentalities capable of operation on a Wireless Telecommunications Network employ the patented data transmission method claimed by the '326 Patent in which the transmission of data of variable length is circularly shifted to improve the speed of communications, where the shift is related to the number of space time streams and the modulation order. An exemplary chart illustrating this and how at least one claim of the '326 Patent covers an Accused Instrumentality is attached as Exhibit F.

63. Defendant has and continues to directly infringe the '326 Patent, literally and/or under the doctrine of equivalents, by making, using, selling, offering for sale, and/or importing in or into the United States one or more apparatuses that embody and practice at least claim 1 of the '326 Patent in violation of 35 U.S.C. § 271(a), including but not limited to Defendant's Accused

Instrumentalities capable of operation on a Wireless Telecommunications Network.

64. Defendant likewise, with knowledge of the '326 Patent, and without authority, has actively induced and continues to actively induce infringement of at least claim 1 of the '326 Patent under 35 U.S.C. § 271(b), by intentionally inducing the infringing use, offer for sale, and/or sale of the Accused Instrumentalities by and with Wireless Telecommunication Networks and their operators and end-users. Each Accused Instrumentality employs the patented data transmission method where the transmission of data of variable length is circularly shifted depending on the number of space time streams and the modulation order. The Accused Instrumentalities are designed to be used by and with Wireless Telecommunications Networks and their operators in an infringing manner that practices the '326 Patent. Similarly, the Accused Instrumentalities are configured to be used by end-users of the Wireless Telecommunications Networks in an infringing manner that practices the '326 Patent.

65. Defendant actively induces Wireless Telecommunications Network operators and end-users to practice the '326 Patent, without authority, by, *inter alia*, designing and introducing into the stream of commerce the Accused Instrumentalities, which employ the patented data transmission method. Defendant encourages infringing use of the Accused Instrumentalities by the Wireless Telecommunications Network operators and end-users by, for example, publishing manuals and promotional literature describing and instructing in the operation of the Accused Instrumentalities in an infringing manner. At the encouragement by and direction of Defendant, the Wireless Telecommunications Network operators sell and offer for sale Accused Instrumentalities to end-users to be used in an infringing manner. Such conduct results in induced infringements of at least claim 1 of the '326 Patent when the Accused Instrumentalities are used for their intended purpose. Defendant has had knowledge that the acts of Wireless Telecommunications Network operators and end-users constitute direct infringement of at least one claim of the '326 Patent since it received

notice of its infringement of the '326 Patent.

66. Defendant likewise is liable for contributory infringement. Defendant, with knowledge of the '326 Patent, and without authority, has offered to sell, sold, and/or imported into the United States the Accused Instrumentalities for use in practicing the patented apparatus and methods embodied in at least claim 1, which use constitutes a material part of the claimed invention. Defendant offered to sell, sold, and/or imported into the United States the Accused Instrumentalities knowing that each is especially made or adapted for use in infringing the '326 Patent, and that each is not a staple article or commodity of commerce suitable for substantial noninfringing use as packaged, advertised, and/or sold because the Accused Instrumentalities are pre-configured by Defendant to employ the patented data transmission method.

67. Defendant has had actual knowledge of the '326 Patent since no later than September 26, 2018.

68. Defendant has continued making, using, offering for sale, selling, and/or importing the accused instrumentalities despite an objectively high likelihood that its actions infringe at least one claim of the '326 Patent thus making Defendant liable for willful infringement damages pursuant to 35 U.S.C. § 284.

69. Defendant's direct, indirect, contributory, and willful infringement of the '326 Patent has caused, and will continue to cause, substantial and irreparable damage to STC.UNM. Therefore, STC.UNM is entitled to an award of damages adequate to compensate for Defendant's infringement of the '326 Patent, but not less than a reasonable royalty, together with pre- and post-judgment interest, attorneys' fees, and costs as fixed by the Court under 35 U.S.C. §§ 284 and 285.

XI. JURY DEMAND

70. Plaintiff STC.UNM hereby demands a trial by jury for all causes of action.

XII. PRAYER FOR RELIEF

71. Plaintiff requests the following relief:

A. A judgment that Defendant has directly infringed either literally and/or under the doctrine of equivalents and continues to directly infringe the '204 Patent, the '096 Patent, and the '326 Patent;

B. A judgment that Defendant has induced infringement and continues to induce infringement of the '204 Patent, the '096 Patent, and the '326 Patent;

C. A judgment that Defendant has contributorily infringed and continues to contributorily infringe the '204 Patent, the '096 Patent, and the '326 Patent;

D. A judgment and order requiring Defendant to pay Plaintiff damages under 35 U.S.C. § 284, including treble damages for willful infringement as provided by 35 U.S.C. § 284, and supplemental damages for any continuing post-verdict infringement through entry of the final judgment with an accounting as needed;

E. A judgment that this is an exceptional case within the meaning of 35 U.S.C. § 285 and Plaintiff is therefore entitled to reasonable attorneys' fees.

F. A judgment and order requiring Defendant to pay Plaintiff pre-judgment and post-judgment interest on the damages awarded;

G. A judgment and order awarding a compulsory ongoing royalty;

H. A judgment and order awarding Plaintiff costs associated with bringing this action;

I. A judgment granting a preliminary and permanent injunction that restrains and enjoins Defendant, its officers, directors, employees, agents, servants, parents, subsidiaries, successors, assigns, and all those in privity, concert or participation with them from directly or indirectly infringing the '204 Patent, the '096 Patent, and the '326 Patent; and

J. Such other and further relief as the Court deems just and equitable.

Dated: July 19, 2019

Respectfully submitted,

By: /s/ Charles L. Ainsworth
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